42. An electroluminescent (EL) device of claim 1, where in *p-n* junction is replaced by an *n-p-n* junction comprising:

a *n*-doped silicon layer on insulator substrate, comprising thin doped Si *n/n+* regions separated by insulating regions, such as SiO_2,

said *n+* regions are contacted to form bottom electrodes;

a thin-layer of Si which allows further epitaxial growth;

a *p*-type Si layer,

the said layer has addressing contact electrodes;

a thin (about 10 nm) SiO_2 layer is deposited, which is patterned with a pitch of about 0.1microns;

a *p*-Si layer forming nanotips is deposited;

an *n*-type wide energy gap layer selected from a group of semiconductors such as $Zn_aMg_{1-a}Se$, $Zn_aMg_{1-a}S$, $Zn_aMg_{1-a}S_bSe_{1-b}$, $Zn_aBe_{1-a}S_bSe_{1-b}$, $Al_cGa_{1-c}N$, ZnMgBeSe, AlInN is stacked on the layer comprising of nanotips;

a layer comprising of cladded quantum dots;

a wider gap semiconductors layer selected from semiconductors consisting of: $Zn_aMg_{1-a}Se$, $Zn_aMg_{1-a}S$, $Zn_aMg_{1-a}S_bSe_{1-b}$, $Zn_aBe_{1-a}S_bSe_{1-b}$, $Al_cGa_{1-c}N$, ZnMgBeSe, AlInN;

a layer forming contact electrodes;

said set of electrodes are appropriately biased and addressed to create a two-dimensional display.--

43. An EL device as described in claim 42, wherein the *n-p-n* layered structure is replaced by a *p-n-p* configuration. --

REMARKS

Due to the large number of independent claims, the application may be mistreated as many different inventions. Actually, the invention is has only one generic idea as defined in claim 1. Therefore, all the other claims have been amended to be dependent on the independent claim 1.

Respectfully submitted,

Hung Chang LIN, Patent Agent, Registration No.28,789
8 Schindler Court, Silver Spring, MD 20903
Telephone: 301-434-3571

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Faquir C. JAIN and Fotios PAPADIMITRAKOLPOULOS Art unit: 1774

Serial No. 09/547,415 Examiner: D. GARRETT

Filed: April 11, 2000

For: FULL COLOR DISPLAY STRUCTURE USING CNC THIN FILM

PRRELIMINARY AMENDMENT (marked-up copy)

Commissioner of Patents

Washington, D.C. 20231

Sir:

Please amend the original patent application as follows:

IN THE CLAIMS:

Please rewrite claim 2 as follows:

--2. [A Schottky barrier electroluminescent device, comprising multiple layers of:

a semiconductor on insulator substrate having:

a first *n*-doped Si layer grown on the said substrate,

having a plurality of rows of oxide isolation separating bottom electrodes;

a thin-layer of Si which allows further epitaxial growth;

a *n*-doped wide energy gap semiconductor layer grown epitaxially;

a layer of pseudomorphic cladded quantum dots nanocrystals (CNCs) deposited on the said wide energy gap layer;

a thin wide energy gap semiconductor layer grown on the CNC layer; and

a metal layer deposited selectively on the wide energy semiconductor layer to form top Schottky contact electrodes.]

An EL device of claim 1, wherein the thin wide energy gap semiconductor layer over the said CNC layer is undoped.--

Please delete claim 4.

Please amend claim 5 as follows:

--5. An EL device of claim [3] 1, wherein said CNC layer is sandwiched between compatible wide energy gap semiconductor layers seleced from the group of

semiconductors consisting of $Zn_aMg_{1-a}Se$, $Zn_aMg_{1-a}S$, $Zn_aMg_{1-a}S_bSe_{1-b}$, $ZnaBe_{1-a}S_bSe_{1-b}$, $AlcGa_{1-c}N$, and AlInN.--

Please amend claim 8 as follows:

--8. An EL device of claim 1, wherein the [CNC] layer comprising CNC further comprises multiple layers of CNCs sandwiched between epitaxially grown thin film layers of wide energy gap semiconductors. --

Please cancel claims 9.

Please rewrite claim 11 as follows:

--11. An device EL device as described in claim [2, wherein said CNC layer has more than one sublayers stacked to emit different colors and white light] 1, wherein said first p-doped Si layer is substituted by a transparent ITO, forming the bottom electrodes.--

Please rewrite claims 13-16 as follows:

--13. [An EL device as described in claim 2, wherein CNCs are deposited to produce red, green and blue pixel elements for a display panel.]

An EL device of claim 1, wherein the *p*-doped wide energy gap semiconductor layer underneath the said CNC layer is replaced by a dielectric layer.

14. [An electroluminescent (EL) device, comprising multiple layers of:

a plurality of transparent electrodes on an insulator substrate;

a first dielectric layer deposited on said set of transparent electrodes;

a layer comprising pseudomorphic cladded quantum dots nanocrystals (CNCs) deposited on said dielectric layer;

a second dielectric layer deposited on said CNC layer; and

a metal layer forming top contact electrode is deposited on the second dielectric layer.]

An EL device of claim 1, wherein the wide energy gap semiconductor layer having *n*-type conductivity over the said CNC layer is replaced by a dielectric layer.

15. [An electroluminescent device of claim 14, wherein the CNC layers comprise of CNCs such as $Zn_xCd_{1-x}Se$ (core)–$Zn_yMg_{1-y}Se$ (cladding), $Zn_xCd_{1-x}Se$ (core)–$Zn_zBe_{1-z}Se$ (cladding), $Zn_xCd_{1-x}Se$ (core)–ZnMgSSe (cladding), $In_xGa_{1-x}N$ (core)- GaN (cladding), GaN (core)-AlGaN (cladding), and ZnCdS (core)-ZnMgS (cladding).]

An electroluminescent device of claim 13, wherein the dielectric layers are selected from the group consisting of SiON, Ta_2O_5, $Ba_xSr_{1-x}TiO_3$, PLZT, $Zn_xMg_{1-x}S$, $Zn_xBe_{1-x}S$, etc., or their combination.

16. An electroluminescent device of claim 14, wherein the [first dielectric layer and the second dielectric layer] dielectric layers are selected from the group consisting of SiON, Ta_2O_5, $Ba_xSr_{1-x}TiO_3$, PLZT, $Zn_xMg_{1-x}S$, $Zn_xBe_{1-x}S$, etc., or their combinations.--

Please cancel claim 17.

Please rewrite claim 18 as follows:

--18. An [electroluminescent (]EL[)] device[,comprising multiple layers of:

a *p*-doped silicon on insulator substrate, said layer having contact electrodes;

a *p*-doped wider energy gap semiconductor layer grown epitaxially on said *p*-doped Si regions;

a layer of pseudomorphic cladded quantum dots nanocrystals (CNCs) deposited on said dielectric layer;

a hole-blocking layer deposited on said CNC layer; and

a metal layer forming top contact electrodes deposited on the hole-blocking layer.] of claim 1, wherein the wide energy gap semiconductor layer having *n*-type conductivity over the said CNC layer is replaced by a hole-blocking layer.--

Please cancel claim19.

Please cancel claim 21.

Please rewrite claim 22 as follows:

--22. An [electroluminescent (]EL[)] device[,]of claim 1, wherein the *p*-doped wide energy gap semiconductor layer underneath the said CNC layer is replaced by a hole-transporting organic semiconductor layer. [comprising multiple layers of:

a *n*-doped silicon layer on insulator substrate, said layer having contact electrodes;

a *n*-doped wider energy gap semiconductor layer grown epitaxially on said Si layer;

a layer of pseudomorphic cladded quantum dots nanocrystals (CNCs) deposited on said wider energy gap semiconductor layer;

a hole-transporting layer of wide-energy gap organic semiconductor on said CNC layer;

an organic conductive layer deposited on said hole-transporting layer; and

a metal layer forming top contact electrodes deposited on the said organic conductive layer.]--

Please cancel claims 23-24.

Please cancel claim 28.

Please cancel claims 30-37.

Please rewrite claims 38-39 as follows:

--38. An electroluminescent device[,] of claim 22, wherein both hole-transporting layer and CNC layer is substituted by a viscous composite comprising of CNCs, hole-transporting organic semiconductors, oxidative agents, soluble salts and low vapor pressure viscosity-modifying agents. [comprising multiple layers of:

a transparent conductor on insulator substrate;

a viscous composite, comprising of CNCs, hole-transporting organic semiconductors, oxidative agents, soluble salts and low vapor pressure viscosity-modifying agents;

said viscous composite is sandwiched between the said transparent electrode and another electrode, which is separated by uniform spacers.]

39. An electroluminescent device of claim 38, wherein viscous composite is contained within appropriate openings realized between said elastomeric spacers. [wherein said spacers are made of elastomers containing appropriate holes for containing the said viscous composite.]--

Please rewrite claims 41-43 as follows:

--41. An EL device as described in claim 40, wherein the viscous composites [is] are introduced by [a] methods such as screen-printing and ink-jet printing.

42. An electroluminescent (EL) device[,] of claim 1, where in *p-n* junction is replaced by an *n-p-n* junction comprising: [comprising multiple layers of:]

a *n*-doped silicon layer on insulator substrate, comprising thin doped Si *n/n+* regions separated by insulating regions, such as SiO_2,

said *n+* regions are contacted to form bottom electrodes;

a thin-layer of Si which allows further epitaxial growth;

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0.1microns;

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a layer comprising of cladded quantum dots;

a wider gap semiconductors layer selected from semiconductors consisting of: $Zn_aMg_{1-a}Se$, $Zn_aMg_{1-a}S$, $Zn_aMg_{1-a}S_bSe_{1-b}$, $Zn_aBe_{1-a}S_bSe_{1-b}$, $Al_cGa_{1-c}N$, ZnMgBeSe, AlInN;

a layer forming contact electrodes;

said set of electrodes are appropriately biased and addressed to create a two-dimensional display.

43. An EL device as described in claim 42, wherein the *n-p-n* layered structure is replaced by a *p-n-p* configuration. [layers starting from the substrate are of *p-n-p* configuration; said bottom electrodes are *p/p+* type, the middle layer comprising of nanotips is *n*-type, and the wider energy gap layers sandwiching the nanoparticles are p-type semiconductors.]--

REMARKS

Due to the large number of independent claims, the application may be mistreated as many different inventions. Actually, the invention is has only one generic idea as defined in claim 1. Therefore, all the other claims have been amended to be dependent on the independent claim 1.

Respectfully submitted,

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